

WHAT IS CLAIMED IS:

1. An apparatus for producing biochips, comprising:
means for amplifying a plurality of DNA molecules previously prepared on a mother substrate using a PCR method; and
means for transcribing the amplified molecules to other substrates by direct contact while maintaining the positional relationship of sites.

2. The apparatus of claim 1, wherein said means for amplifying comprises means for applying PCR on a first copy substrate or applying PCR with said mother substrate coupled to said first copy substrate.

3. The apparatus of claim 1, wherein said mother substrate and said other substrates are made of a porous material.

4. The apparatus of claim 1, wherein said means for transcribing comprises means for pressurizing or heating said sites on said mother substrate from a backside thereof thereby to facilitate DNA transcribing to said other substrates.

5. The apparatus of claim 1, comprising means for forming walls for separating said sites .

6. The apparatus of claim 1, comprising means for shaping said mother substrate to be arched; and wherein said means for transcribing comprises means for rotating said mother substrate so that DNA is transcribed to other substrates.

7. A method for producing biochips by arranging sites of DNA, RNA or protein in arrays on a substrate, wherein DNA, RNA or protein chips are produced by using a process comprising at least one of

the following steps:

depositing a solution containing DNA, RNA or protein onto said substrate from a backside thereof; and

applying positive and negative voltages to an electrode on a side of said substrate and to an electrode on the side of said substrate onto which said solution is deposited.

8. An apparatus for producing biochips by arranging sites of DNA, RNA or protein in arrays on a substrate, comprising at least one of the following:

means for depositing a DNA, RNA or protein solution onto said substrate from a backside thereof; and

means for applying positive and negative voltages to an electrode on a side of said substrate and to an electrode on the side of said substrate onto which said solution is deposited.

9. The apparatus of claim 8, wherein said means for depositing comprises means for depositing said solution onto said substrate using a plurality of pins or an array of pins.

10. The apparatus of claim 9, wherein said means for depositing comprises means for cleaning tips of said plurality of pins or pins in said array of pins; and means for depositing a solution containing DNA, RNA or protein onto said tips, said plurality of pins and said pins in said array of pins being brought into contact with a cleaning fluid and said solution from either the backside or topside of said substrate, in the same manner as said solution being deposited onto said substrate.

11. A method for producing biochips by arranging biomolecules in arrays on a substrate, wherein said biomolecules are deposited onto the substrate using a capillary array comprising a plurality of capillaries arranged at the same spacing interval as that of sites on said substrate.

12. The method of claim 11, wherein said biomolecules are deposited by applying voltage across said capillary array and said substrate.

13. The method of claim 11, wherein said biomolecules are deposited by pressurizing each capillary of said capillary array.

14. The method of claim 11, wherein DNA contained within said capillary array is amplified within said capillaries thereof by polymerase chain reaction.

15. The method of claim 14, wherein said polymerase chain reaction is performed by atmospheric temperature change or by heating with laser irradiation.

16. An apparatus for producing biochips by arranging biomolecules in arrays on a substrate, said apparatus comprising:

capillary holder means for supporting a plurality of capillaries arranged at a same spacing interval as that of sites on a biochip;

means for adjusting a gap formed between said capillary holder means and said substrate by moving either said capillary holder means or said substrate, or both; and

means for transferring biomolecules from said capillaries to said substrate.

17. The apparatus of claim 16, wherein said means for trans-

ferring comprises: voltage source means for applying voltage across said capillary holder means and said substrate, so that biomolecules contained in said capillaries are deposited onto said substrate.

18. The apparatus of claim 16, wherein said means for transferring comprises: means for pressurizing said capillaries so that biomolecules contained in said capillaries are deposited onto said substrate.

19. The apparatus of claim 16, further comprising means for amplifying DNA in said capillaries by means of polymerase chain reaction.

20. The apparatus of claim 17, further comprising means for amplifying DNA in said capillaries by means of polymerase chain reaction.

21. The apparatus of claim 18, further comprising means for amplifying DNA in said capillaries by means for polymerase chain reaction.

22. The apparatus of claim 19, wherein said means for amplifying comprises means for providing said polymerase chain reaction by temperature processing.

23. The apparatus of claim 20, wherein said means for amplifying comprises means for providing said polymerase chain reaction by temperature processing.

24. The apparatus of claim 21, wherein said means for amplifying comprises means for providing said polymerase chain reaction by temperature processing.

25. The apparatus of claim 16, comprising means for positioning said substrate above or below said capillaries.

26. The apparatus of claim 17, comprising means for positioning said substrate above or below said capillaries.

27. The apparatus of claim 18, comprising means for positioning said substrate above or below said capillaries.

28. The apparatus of claim 19, comprising means for positioning said substrate above or below said capillaries.

29. The apparatus of claim 20, comprising means for positioning said substrate above or below said capillaries.

30. The apparatus of claim 21, comprising means for positioning said substrate above or below said capillaries.

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